

REMARKS

Claims 1-20 are all the claims pending in the application. Claims 5 and 10 contain allowable subject matter. Claims 1-4, 6-9, and 11-20 stand rejected on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion. Claims 5 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim.

I. The Claim Objections

The Office Action states that claims 5 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim. The Office Action admits that the prior art of record fails to teach or reasonably suggest that the at least one battery connects to a pair of opposed upright ends of the package. As such, claims 5 and 10 are amended and written in independent form comprising all of the limitations of independent base claims 1 and 7, respectively. As such, Applicants respectfully request that this objection be reconsidered and withdrawn, and for claims 5 and 10 to be allowed as amended.

II. The 35 U.S.C. §102(b) Rejections

A. The Position in the Office Action

Claims 1, 2, 11, and 16 stand rejected under 35 U.S.C. §102(b) as being anticipated by

Hundt et al. (U.S. Patent No. 5,451,715), hereinafter "Hundt". Moreover, claim 7 is rejected under 35 U.S.C. §102(b) as being anticipated by Bolotin et al. (U.S. Patent No. 6,206,705), hereinafter "Bolotin". According to the Office Action, in regard to claim 1, Hundt shows an integrated circuit package with at least one battery (refer to col.3, lines 21-23); at least one integrated circuit chip powered by said at least one battery (refer to col.2, lines 58-59); and a package connected to said at least one battery and said at least one integrated circuit chip (refer to col.2, lines 56-64). In regard to claim 2, the Office Action suggests that Hundt shows the package connects to said at least one integrated circuit chip through an interior portion of the package (refer to col.3, lines 13-16). In regard to claim 11, the Office Action indicates that Hundt shows an integrated circuit chip (refer to col.2, lines 58-59); a battery directly connected to said integrated circuit chip (refer to col.2, lines 63-64 and col.3, lines 3-8). Next, in regard to claim 16, the Office Action states that Hundt shows a package (refer to col.2, line 56); an integrated circuit chip mounted on the package (refer to col.2, lines 58-59); and a battery directly connected to the package and electrically connected to the integrated circuit chip (refer to col.2, lines 63-65 and col.3, lines 3-9). Finally, in regard to claim 7, the Office Action suggests that Bolotin shows the integrated circuit package comprising a multi-chip module (refer to col.2, lines 5-7); at least one battery connected to the multi-chip module (refer to col.2, lines 60-64); and at least one integrated circuit chip to the battery, wherein said integrated circuit chip is powered by the battery (refer to col.3, lines 31-34 and col.2, lines 62-64). Applicants respectfully traverse these rejections based on the following discussion.

1. The Hundt Reference

Hundt teaches a packaged integrated circuit and method of manufacturing the same. In Hundt, the semiconductor integrated circuit chip is mounted and bonded to a lead frame in the conventional fashion, and an inner molded body is formed therearound. The leads of the lead frame have inner and outer dambars, with the inner dambars located so as to prevent bleedout of mold compound during the molding of the inner body. Upon removal of the inner dambars, two tie bars become floating and are then formed to extend above the inner molded body so as to make contact to an electrochemical cell that is attached to the inner molded body. An outer body is then molded to surround the inner molded body and the cell, with the outer dambars located so as to prevent bleedout of mold compound. Removal of the outer dambars and formation of the leads into the desired shape completes the assembly of the packaged integrated circuit. A molded integrated circuit package including both the integrated circuit together with a battery for backup or primary power is thus provided.

2. The Bolotin Reference

Bolotin teaches a three-dimensional connection system uses a plurality of printed wiring boards with connectors completely around the printed wiring boards, and connected by an elastomeric interface connector. The device includes internal space to allow room for circuitry. The device is formed by stacking an electronics module, an elastomeric interface board on the electronics module such that the interface board's exterior makes electrical connection with the connectors around the perimeter of the interface board, but the internal portion is open to allow

room for the electrical devices on the printed wiring board. A plurality of these devices are stacked between a top stiffener and a bottom device, and held into place by alignment elements.

B. Applicants' Response

As amended, the present application overcomes the rejections based on the cited prior art. Namely, as amended, independent claims 1, 11, and 16 recite "a package having a pair of opposed upright ends." Furthermore, independent claim 7 recites "a multi-chip module having a pair of opposed upright ends." By incorporating these distinctions of having a pair of opposed upright ends, the present invention is patentably distinct from the cited prior art because none of the cited prior art, specifically, Hundt nor Bolotin teaches or suggests a pair of opposed upright ends of the package or multi-chip module. In fact, it is admitted by the Office Action that the prior art of record fails to teach or reasonably suggest that the battery connects to a pair of opposed upright ends of the package. Thus, it follows that the prior art also fails to teach or reasonably suggest that the package (or multi-chip module) has a pair of opposed upright ends, as the present invention does.

Thus, the structures in Hundt and Bolotin are different than the present invention and, as such, do not teach the present invention. Therefore, claims 1, 2, 7, 11, and 16 are patentably distinct over the cited prior art, and as such, Applicants respectfully request that this rejection be reconsidered and withdrawn.

III. The 35 U.S.C. §103(a) Rejections

A. The Position in the Office Action

With respect to the prior art rejections, claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hundt et al. (U.S. Patent No. 5,451,715), hereinafter "Hundt" in combination with Bond et al. (U.S. Patent No. 5,724,728), hereinafter "Bond". Also, claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hundt in combination with Bond, and further in combination with Tuttle et al. (U.S. Patent No. 5,779,839), hereinafter "Tuttle 1". Next, claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hundt in combination with Tuttle et al. (U.S. Patent No. 5,787,174), hereinafter "Tuttle 2". Additionally, claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bolotin et al. (U.S. Patent No. 6,206,705), hereinafter "Bolotin" in combination with Hundt. Moreover, claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bolotin in combination with Bond. Furthermore, claims 12-15 and 17-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hundt in combination with Burstein et al. (U.S. Patent No. 6,278,264), hereinafter "Burstein". Finally, claim 20 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hundt in combination with Tuttle 1.

With respect to the rejection of claim 3, the Office Action states that Hundt discloses the elements as discussed above, except, as the Office Action admits, Hundt does not teach a battery that overhangs the integrated circuit chip, wherein the integrated circuit chip connects to an upper indent portion of the package. However, the Office Action indicates that Bond shows a battery that overhangs the integrated circuit chip, wherein the integrated circuit chip connects to an upper indent portion of the package (refer to Fig. 1B and col.4, lines 38-56). As such, the Office Action concludes that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Hundt to include a battery that overhangs the integrated circuit chip, wherein the integrated circuit chip connects to an upper

indent portion of the package as taught by Bond for the purpose of being electrically connected between a battery and the at least one integrated circuit chip.

With respect to the rejection of claim 6, the Office Action states that Hundt and Bond disclose the elements as claimed, except for at least one battery further comprising a stack of connected batteries. However, the Office Action supposes that Tuttle 1 shows at least one battery further comprising a stack of connected batteries (refer to col.14, lines 44-49). Thus, according to the Office Action it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Hundt and Bond to include at least one battery further comprising a stack of connected batteries taught by Tuttle 1 for the purpose of stacked battery cells.

With respect to the rejection of claim 4, the Office Action submits that Hundt discloses the elements as discussed above, except for at least one battery that connects to an underside of the package. Specifically, according to the Office Action, Tuttle 2 shows at least one battery connecting to an underside of the package (refer to Fig.2 and col.3, lines 13-22). Therefore, the Office Action concludes that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Hundt to include at least one battery that connects to an underside of the package as taught by Tuttle 2 for the purpose to case [the concealed battery].

Next, with respect to the rejection of claim 8, the Office Action indicates that Bolotin discloses the elements as discussed above, except for at least one integrated circuit chip through an interior portion of the multi-chip module. The Office Action then states that Hundt shows at least one integrated circuit chip through an interior portion of the package (refer to col.3, lines 13-16). Thus, the Office Action concludes that it would have been obvious to a person having

ordinary skill in the art at the time the invention was made to modify the device of Bolotin to include at least one integrated circuit chip through an interior portion of the package as taught for the purpose of implementing the battery powered integrated circuits.

With respect to the rejection of claim 9, the Office Action states that Bolotin discloses the elements as discussed above, except for a battery that overhangs the integrated circuit chip, wherein the integrated circuit chip connects to an upper indent portion of the multi-chip module. However, the Office Action suggests that Bond shows a battery that overhangs the integrated circuit chip, wherein the integrated circuit chip connects to an upper indent portion of the package (refer to Fig. 1B and col. 4, lines 38-56). Moreover, the Office Action concludes that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Bolotin to include a battery overhanging the integrated circuit chip, wherein the integrated circuit chip connects to an upper indent portion of the package as taught by Bond for the purpose to increase the density of integrated circuits.

With respect to the rejections of claims 12 and 13, it is the position in the Office Action that Hundt discloses the elements as discussed above, except for the solder connections between the battery and an integrated circuit chip. Moreover, the Office Action states that Burstein shows the solder connections between the battery and an integrated circuit chip (refer to Fig. 2, col. 5, lines 9-10 and lines 57-64). As such, the Office Action surmises that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Hundt to include the solder connections between the battery and an integrated circuit chip as taught by Tuttle for the purpose of an integrated circuit and a battery which are electrically coupled by solder balls.

With respect to the rejection of claim 14, the Office Action states that Hundt shows a package having at least one battery and an integrated circuit chip (refer to col.2, lines 56-65). Also, with respect to the rejection of claim 15, the Office Action concludes that Burstein shows a battery directly connected to the package (refer to col.5, lines 9-10). Next, with respect to the rejection of claim 17, it is the position in the Office Action that Hundt shows a battery being held adjacent to an integrated circuit chip by the package (refer to Fig. 1 and col.3, lines 3-8). Moreover, with respect to the rejection of claim 18, the Office Action indicates that Burstein shows a package between the battery and an integrated circuit chip (refer to col.5, lines 9-10). Additionally, with respect to the rejection of claim 19, the Office Action states that Hundt shows a battery electrically connected to the integrated circuit chip through the battery (refer to Fig.1 and col.3, lines 3-8).

Finally, with respect to the rejection of claim 20, it is the position in the Office Action that Hundt discloses the elements as discussed above, except for the multiple batteries stacked on the package. Nonetheless, the Office Action concludes that Tuttle 1 shows the multiple batteries stacked on the package (refer to col.14, lines 45-47). Therefore, the Office Action surmises that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Hundt to include the multiple batteries stacked on the package as taught by Tuttle 1 for the purpose to provide a detachable module.

1. The Bond Reference

Bond teaches a system for packaging integrated circuit components including a ball grid array substrate with a plurality of solder balls coupled to the substrate. A semiconductor device

is mounted on the substrate and electrically coupled to the solder balls. One or more terminals are coupled to the substrate and electrically coupled to said semiconductor device. A detachable module contains auxiliary component. The module comprises a body portion for containing the component and one or more electrical connectors for mating with respective terminals to hold the module to the substrate and to electrically couple the component with the semiconductor device. The terminals may also be connected to the solder balls such that a component may be optionally provided either on the circuit board or in the detachable module.

3. The Tuttle 1 Reference

Tuttle 1 teaches a method of manufacturing an enclosed transceiver, such as a radio frequency identification ("RFID") tag. Structurally, in one embodiment, the tag comprises an integrated circuit (IC) chip, and an RF antenna mounted on a thin film substrate powered by a thin film battery. A variety of antenna geometries are compatible with the above tag construction. These include monopole antennas, dipole antennas, dual dipole antennas, a combination of dipole and loop antennas. Further, in another embodiment, the antennas are positioned either within the plane of the thin film battery or superjacent to the thin film battery.

4. The Tuttle 2 Reference

Tuttle 2 teaches circuitry mounted within a single hybrid or monolithic integrated circuit (I.C.) package including: (1) a first integrated circuit which is desired to be tracked for some purpose such as security or inventory, and (2) a second circuit having a memory for storing an

identification number and an RF transceiver for transmitting the stored number in response to an RF interrogation signal. For security purposes, the invention makes it difficult or impossible for a thief to alter the identification number without destroying the I.C., because the identification number is stored in memory within the I.C. For inventory purposes, the invention overcomes the need to affix an external identification tag to the I.C. package. The invention is especially suited for protecting a highly valuable first integrated circuit such as a microprocessor.

5. The Burstein Reference

Burstein teaches a voltage regulator with an input terminal and an output terminal having a printed circuit board, a substrate mounted on the printed circuit board, and a first flip-chip type integrated circuit chip mounted on the substrate. The first integrated circuit chip includes a first power switch fabricated therein to alternately couple and decouple the input terminal to the output terminal. A filter is disposed to provide a substantially DC voltage at the output terminal, and a control circuit controls the power switch to maintain the DC voltage substantially constant.

6. Applicants' Response

As amended, the present application overcomes the rejections based on the cited prior art. As indicated above, independent claims 1, 7, 11, and 16, upon which dependent claims 3-4, 6, 8-9, 15-15, and 17-20 depend thereon, respectively, have been amended, and as such are patentably distinct over the several cited prior art. As such the limitations recited in dependent claims 3-4,

6, 8-9, 15-15, and 17-20 now read in light of amended claims 1, 7, 11, and 16, respectively, render claims 3-4, 6, 8-9, 15-15, and 17-20 patentably distinct over the cited prior art.

Moreover, dependent claim 14 has been amended and now recites "The structure in claim 11, wherein said package surrounds said battery and said integrated circuit chip". Again, when read in light of newly amended independent claim 11, upon which claim 14 depends upon, claim 14 is now patentably distinct over Hundt.

Moreover, the references, including Hundt, Bolotin, Bond, Tuttle 1, Tuttle 2, and Burstein, hereinafter the "collective prior art", are bereft of any language, suggestion, or example where the package or multi-chip module has a pair of opposed upright ends. Rather, the collective prior art merely suggests either fully enveloped packages or multi-chip modules or completely uniform and planar packages or multi-chip modules. Thus, the structures shown and described in the collective prior art is different than the present invention and, as such, does not teach the present invention. Moreover, even if the teachings of collective prior art were legally combinable with one another, it would still not teach the novel features of the present invention. Therefore, claims 3-4, 6, 8-9, 11-15, and 17-20 are patentably distinct over the collective cited prior art, and as such, Applicants respectfully request that these rejections be reconsidered and withdrawn.

Insofar as references may be combined to teach a particular invention, and the proposed combination of Hundt, Bolotin, Bond, Tuttle 1, Tuttle 2, and Burstein in various combinations with one another, case law establishes that, before any prior-art references may be validly combined for use in a prior-art 35 U.S.C. § 103(a) rejection, the individual references themselves or corresponding prior art must suggest that they be combined.

For example, in In re Sernaker, 217 U.S.P.Q. 1, 6 (C.A.F.C. 1983), the court stated:

"[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings." Furthermore, the court in Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 U.S.P.Q.2d 1434 (C.A.F.C. 1988), stated, "[w]here prior-art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. . . . Something in the prior art must suggest the desirability and thus the obviousness of making the combination."

In the present application, the reason given to support the proposed combination is improper, and is not sufficient to selectively and gratuitously substitute parts of one reference for a part of another reference in order to try to meet, but failing nonetheless, the Applicants' novel claimed invention. Furthermore, the present claimed invention, as amended, meets the above-cited tests for obviousness by including embodiments such as "a package having a pair of opposed upright ends," as recited in amended claims 1, 11, and 16, respectively and "a multi-chip module having a pair of opposed upright ends," as recited in amended claim 7. As such, all of the claims of this application are, therefore, clearly in condition for allowance, and it is respectfully requested that the Examiner pass these claims to allowance and issue.

As declared by the Federal Circuit:

In proceedings before the U.S. Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. The Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Fritch, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992) citing In re Fine, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

Here, the Examiner has not met the burden of establishing a prima facie case of obviousness. It is clear that, not only does Hundt fail to disclose all of the elements of the claims of the present invention, particularly, the package or multi-chip module having opposed upright ends, as discussed above, but also, if combined with Bond, Tuttle 1, Tuttle 2, Bolotin, or Burstein, fails to disclose this element as well. The unique elements of the present invention are clearly an advance over the prior art.

The Federal Circuit also went on to state:

The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. . . . Here the Examiner relied upon hindsight to arrive at the determination of obviousness. It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. Fritch at 1784-85, citing In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

Here, there is no suggestion that Hundt, alone or in combination with Bolotin, Bond, Tuttle 1, Tuttle 2, or Burstein teaches a structure containing all of the limitations of the claimed invention. Consequently, there is absent the "suggestion" or "objective teaching" that would have to be made before there could be established the legally requisite "prima facie case of obviousness."

In view of the foregoing, Applicants respectfully submit that the collective cited prior art do not teach or suggest the features defined by amended independent claims 1, 7, 11, and 16 and as such, claims 1, 7, 11, and 16 are patentable over Hundt alone or in combination with either Bolotin, Bond, Tuttle 1, Tuttle 2, or Burstein. Further, dependent claims 2-4, 6, 8-9, 11-15, and 17-20 are similarly patentable over Hundt alone or in combination with either Bolotin, Bond,

Tuttle 1, Tuttle 2, or Burststein, not only by virtue of their dependency from patentable independent claims, respectively, but also by virtue of the additional features of the invention they define. Thus, Applicants respectfully request that these rejections be reconsidered and withdrawn.

Applicants note that all claims are properly supported in the specification and accompanying drawings, and no new matter is being added. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

IV. Formal Matters and Conclusion

In summary, the present invention overcomes problems in the battery integration arts by providing a structure with a battery, package and/or multi-chip module having a pair of opposed upright ends, and an integrated circuit chip combined together as recited in amended independent claims 1, 7, and 11, and 16, respectively. Thus, Applicants respectfully request allowance of claims 1-20. Moreover, the Applicants respectfully request that claims 5 and 10 be allowed as they have been rewritten in independent form to include the limitations of the base claims 1 and 7, respectively, in accordance with the instructions in the Office Action.

In view of the foregoing, Applicants submit that claims 1-20, all the claims presently examined in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies in fees and credit any overpayments to Attorney's Deposit Account Number 50-0510.

Respectfully submitted,



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Marked Version with Changes Made**IN THE CLAIMS:**

Please substitute the following claims for the same numbered claims in the application.

1 1. (Amended) A system level device for battery and integrated circuit chip integration
2 comprising:
3 at least one battery;
4 at least one integrated circuit chip powered by said at least one battery; and
5 a package having a pair of opposed upright ends, said package connected to any of said at
6 least one battery and said at least one integrated circuit chip.

1 5. (As Amended) [The device of claim 1,] A system level device for battery and integrated
2 circuit chip integration comprising:
3 at least one battery;
4 at least one integrated circuit chip powered by said at least one battery; and
5 a package connected to any of said at least one battery and said at least one integrated
6 circuit chip.

7 wherein said at least one battery connects to a pair of opposed upright ends of said
8 package.

1 7. (As Amended) A system level device for battery and integrated circuit chip integration
2 comprising:

3 a multi-chip module integration system, wherein said multi-chip module integration
4 system comprises:

5 a multi-chip module having a pair of opposed upright ends;
6 at least one battery connected to said multi-chip module; and
7 at least one integrated circuit chip connected to said battery, wherein said
8 integrated circuit chip is powered by said battery.

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1 10. (As Amended) [The device of claim 7,] A system level device for battery and integrated
2 circuit chip integration comprising:

3 a multi-chip module integration system, wherein said multi-chip module integration
4 system comprises:

5 a multi-chip module;
6 at least one battery connected to said multi-chip module; and
7 at least one integrated circuit chip connected to said battery, wherein said
8 integrated circuit chip is powered by said battery,
9 wherein said at least one battery connects to a pair of opposed upright ends of said multi-
10 chip module.

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1 11. (As Amended) An integrated chip structure comprising:

2 an integrated circuit chip; [and]
3 a battery directly connected to said integrated circuit chip[.]; and
4 a package having a pair of opposed upright ends, said package connected to any of said
5 battery and said integrated circuit chip.

1 14. (As Amended) The structure in claim 11, [further comprising a package surrounding at
2 least one of] wherein said package surrounds said battery and said integrated circuit chip.

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1 16. (As Amended) An integrated chip structure comprising:
2 a package having a pair of opposed upright ends;
3 an integrated circuit chip mounted on said package; and
4 a battery directly connected to said package and electrically connected to said integrated
5 circuit chip.

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